

## **Appendix L**

### **Survey Section**

The role of the CST survey team is to enter an area that may be contaminated by a CBRNE hazard and provide an initial assessment of the hazard. CST survey teams can also collect samples and maintain a chain of custody for laboratory analysis. CST survey teams are equipped with a variety of specialized military and civilian CBRNE agent detectors to support the detection and identification. The survey team should be proficient in operating in two teams of two or more survey members. Additionally, the survey team provides, as a minimum, a two-person backup team to assist the entry team in the case of emergency operations.

#### **PREINCIDENT PHASE**

L-1. Service members selected for the CST survey team element must be fully qualified in their respective MOS and must complete appropriate professional development education.

L-2. This training program employs the USACMLS as its foundation and includes courses taught by the civilian EFR community (such as state fire academies and civilian first responder professional organizations). It also includes courses from the US Army Medical Department, US Army FORSCOM, the Director of Military Support, the EPA, the NFA, the Defense Nuclear Weapons School (DNWS), and the FEMA Emergency Management Institute (EMI). Individual training may include toxic agent training at the USACMLS chemical decontamination training facility (CDTF) and suit training for Levels A and B PPE.

L-3. The individual training builds individual competencies in NBC defense procedures, operation of specialized detection equipment, and knowledge of hazardous waste operations practiced by the civilian EFR.

L-4. Each member of the CST survey team maintains individual certifications and qualifications for HAZMAT technician training (29 CFR 1910.120).

L-5. The survey team maintains the capability to conduct CBR surveys.

L-6. Survey team members ensure serviceability and maintenance—

- Authorized PPE.
- Detection and identification equipment.

L-7. Hydration plans and air refill plans for the SCBA tanks will also be developed and initiated.

L-8. The survey team conducts training on (but are not limited to)—

- Joint entry operations.
- Sampling.
- Confined space entry.
- Emergency action drills.

## **ALERT AND DEPLOY PHASES**

L-9. In the alert and deploy phases, equipment preparation and load-out are prioritized based on the WO/OPORD and pre-positioned in load plans.

L-10. Each section conducts inspection of team members' individual equipment. Team members also begin pre-mission inspections.

L-11. During these phases, the CST begins planning entry operations.

## **RESPONSE PHASE**

L-12. In the response phase, the team leader (TL) prepares and issues the initial team WO/OPORD.

L-13. A CST survey mission is a directed effort to obtain information that identifies the type of contamination in a specific area or location. There are many factors to consider before, during, and after a CBRNE incident. The following factors are considered:

- Knowing the hazard prior to entering the site can reduce the amount of detection equipment and time needed to respond, and it also ensures that personnel have the appropriate PPE prior to entering the site. Medical treatment, decontamination solutions, and procedures can be determined if the agent hazard is known.
- Wind direction and speed may affect the agent downwind hazard. Temperature, humidity, rain, fog, and snow may also impact the agent field behavior.
- Variables such as locations of urban environments, heavy or low populated areas, terrain features, accessibility, available resources, and building locations and use are assessed. Structural damage and visibility considerations can also be factors in determining how to respond.
- Other HAZMAT teams, fire departments, hospitals, police, NG, or other federal agencies may also be available and possess capabilities to support operations at an incident site.

L-14. Planning will focus on the assigned missions and consider what other agencies have accomplished.

## **SURVEY TEAM RESPONSE ACTIONS**

L-15. Team members will receive an updated WO/OPORD once on site. They will conduct perimeter monitoring operations to clear CST work areas and verify the hot-zone exclusion area. The team will review building blueprints or diagrams, if needed, and obtain updates to downwind hazard models. Weather briefings, containing primary wind direction and speed, will also be given as needed. Before the survey team enters the hot-zone, the survey TL

recommends the minimum PPE necessary for the entry based on the mission and established guidelines. Teams should conduct rehearsals prior to entering the hot-zone (such as review mission objectives and actions, movement, detection and sample collection procedures, emergency responses, and back brief). See Table L-1, page L-4, for a sample survey team response checklist.

L-16. The survey team debriefs the appropriate personnel at the site, if possible. Ensure that pertinent information is included in the AAR.

L-17. The survey team checks PPE and detection devices for proper functioning. The TL verifies and reinforces the importance of the buddy system and the importance of maintaining contact with one another while operating in the hot-zone. The survey team will conduct communication checks with the operations team and with each other. CST brevity codes can also be communicated as the primary means of alerting the OPCEN and survey TL to an emergency in the hot-zone or the immediate AO. Established warning signals (air horns, sirens, whistles, etc) can provide an alternate means of alert. Mission-abort criteria will be established and reviewed. The survey team also delivers the downrange equipment manifest to the OPCEN prior to site entry. All personnel receive the site safety briefing prior to the initiation of entry operations.

L-18. Once preoperational procedures and checks are completed, the initial entry team and backup team will don the appropriate level of protection, deploy from the cold/warm-zone, and position themselves on the edge of the warm-/hot-zone adjacent to the CST decontamination site. The CST decontamination station must be established upon arrival at the CBRNE incident site prior to the entry of any CST personnel into the hot-zone. The decontamination site also functions as the CST element administrative checkpoint to account for personnel entering and exiting the incident site. The backup team should be positioned where it can concentrate on its primary function of monitoring the activity within the hot-zone and/or waiting to provide assistance. The teams will exercise a rotation schedule based on ambient conditions and protective posture according to the National Fire Protection Association (NFPA). The operations team relays IC approval for entry into the hot-zone. The survey team advises the operations team when it begins using SCBA air and deploys into the hot-zone.

## **INITIAL-ENTRY SAFETY GUIDELINES**

L-19. CSTs must conduct air monitoring before and throughout operations in the hot-zone to identify any atmospheres that are corrosive, combustible, or oxygen-deficient or that contain radioactive or toxic substances that exceed IDLH and exposure over PELs.

**Table L-1. Survey Team Response Checklist (Example)**

1. Prepare survey plan.
2. Prepare survey team rotation schedule and priorities of work.
3. Update hazard assessment.
4. Assist with identification of dress-out, briefing, decontamination, and recovery areas.
5. Be prepared to conduct survey operations within 90 minutes of mission assumption from the IC.
6. Conduct final hazard analysis and determine modified entry points and stay times.
7. Coordinate with the medical section, and receive required preentry screening of personnel within 1 hour of entry into the hot-zone.
8. Establish the mission-abort/turn-back criteria.
9. Identify any mission-abort indicators to the operations team.
10. Review any structural diagrams or blueprints available.
11. Issue equipment, and conduct equipment checks.
12. Ensure that the survey team continuously monitors the hazard.
13. Conduct communications checks with the CST OPCEN.
14. Inform the OPCEN when the lead survey team is ready to enter the hot-zone; request permission to make entry into the hot-zone.
15. Receive authorization from the operations team for entry teams to enter the hot-zone.
16. During reconnaissance activities the survey team will—
  - Report entry into the hot-zone.
  - Report status/position to the OPCEN at predetermined intervals/checkpoints.
  - Pass on any agent detection and identification information as it becomes available.
  - Identify when samples have been collected and ready for hand-off.
  - Call for clearance out of the hot-zone into the decontamination area.
  - Inform the OPCEN regularly of the personnel status and future operations posture.
  - Complete postentry medical screening.

## Monitoring Requirements

L-20. The monitoring requirements are—

- Corrosive vapor/liquid.
- Combustibility (flammability).
- Oxygen levels (deficient and rich).
- Radioactivity.
- Other hazardous products (such as volatile organic chemicals).

## Survey Team Operations—CB or Unknown Hazard

L-21. Factors that influence the survey plan include—

- IC's intent.
- Immediate and continuing safety hazards.
- Indicators of secondary device(s), as required.
- Types of containers or other storage systems.
- Tags, labels, markings, or other identifying indicators.
- The condition of waste containers and storage systems.
- The physical condition of the materials.
- Potential pathways of dispersion.
- Indicators of potential exposure to hazardous substances.
- Reactive, incompatible, flammable, or highly corrosive wastes.
- The presence of any potential naturally occurring skin irritants or dermatitis-inducing agent.
- Weather conditions.

L-22. The team develops survey and sampling plans using information from IC intelligence and initial reconnaissance. They use the reconnaissance techniques of search, survey, and/or sampling. Initially, search techniques are used to find the contamination. Once the contamination is detected and identified, a survey of the area can be performed to determine the size and extent of the contamination. Sampling is conducted after the search or survey is completed and samples of the contamination are required. Sampling is required when the agent identity cannot be determined or confirmed, biological agents are suspected, or proof of use is needed.

L-23. Three search techniques can be employed upon entering a contaminated site. Each technique can be performed mounted or dismounted. These techniques are—

- Zigzag.
- Lane.
- Cloverleaf.

**NOTE: Refer to FM 3-11.19 for the proper execution of these techniques.**

L-24. Three survey techniques can be employed to determine the spread of contamination to CST staging, mission-planning, and decontamination areas. These techniques are—

- Near side/far side.
- Box.
- Star.

**NOTE: Refer to FM 3-11.19 for the proper execution of these techniques.**

L-25. The entry team detects and identifies CBRNE hazards that were present within mission capabilities, provides SITREPs to the operations team, maintains SA, adjusts the survey plan (as required), maintains the buddy system, and checks and collects the following information:

- Locations and types of hazards.
- Physical layouts and descriptions.
- Casualty status or information.
- Additional requirements.
- Video and/or still-camera pictures.

L-26. The survey team and operations team track the length of time soldiers have been "on SCBA air" and the amount of "air time" for the entry, decontamination, DAP, and backup teams. It also identifies any critical tests that need to be performed before hot-zone extraction.

## **SURVEY TEAM OPERATIONS—MONITORING AND SAMPLING**

L-27. The collection of air, vapor, liquid, soil, and other solid samples is an integral part of initial and presumptive identification of known and/or unknown agents. During CST survey and sample collection operations, the survey TL establishes the required protective equipment to fit the situation. CST survey teams will collect samples under varying circumstances. WMD samples should be turned in to the laboratory for use in the identification process (while maintaining a chain of custody).

L-28. Detection equipment may include items such as expended M256A1 kits, draeger tubes, assay tickets, and M8 and M9 detector paper. These items should be recovered, packaged, and delivered to the IC for future disposition.

L-29. The techniques for conducting surveys of CBRNE hazards can be found in FMs 3-11.3 and 3-11.19. During survey team operations, the survey team will—

- Report entry into the hot-zone.
- Provide status/position reports to the OPCEN at predetermined intervals/checkpoints.
- Pass on any agent detection and identification information as it becomes available.
- Identify when samples have been collected and are ready for hand-off.
- Call for clearance out of the hot-zone to the decontamination area.
- Keep the OPCEN informed of the personnel status and future operations posture.

- Complete postentry medical screening.

L-30. When conducting a survey, CST members may face a number of potentially dangerous situations that require specific, immediate action. The following paragraphs describe some of the situations that may be encountered, along with suggested response actions.

L-31. The following actions should be taken if a low-air alarm activates inside a protective suit:

- Notify survey TL to initiate decontamination.
- Notify your TL of the problem.
- Proceed to the decontamination line as directed.
- Draw individual protective equipment (IPE) after decontamination termination.
- Report to the medical-monitoring area.

L-32. The following actions should be taken if a team member goes down:

- Alert CST of the situation (man down).
- Implement the emergency plan.

L-33. The following actions should be taken if team members become separated (TL will advise the CST OPCEN of the situation.):

- Proceed to the rally point.
- Request a backup team if required.
- Advise the OPCEN of the current situation and proceed as directed.

L-34. The following actions should be taken if chemicals are detected that are within flammability ranges:

- Abort the entry and proceed to the clean area.
- Notify the CST OPCEN, and request guidance.
- Plan for mitigation, and execute on order.

L-35. The following actions should be taken if a suit is torn:

- Conduct emergency decontamination.
- Apply tape, if possible.
- Request a backup team if required.
- Proceed immediately to the decontamination line with a team member.
- Notify the survey TL.

**NOTE: Unaffected team members await further orders before entering the decontamination area.**

L-36. The following actions should be taken if a survey team member becomes overheated:

- Report to the survey TL and CST commander.
- Leave as soon as permission is received.
- Request a backup team if required.

L-37. The following action should be taken if a terrorist is encountered:

- Take cover if available.
- Inform the survey TL.
- Move out of the area as soon as possible.

L-38. The following actions should be taken if a team member becomes grossly contaminated:

- Inform the CST OPCEN.
- Conduct emergency decontamination.
- Evacuate from the hot-zone immediately.
- Proceed to the decontamination line immediately with a team member.
- Seek medical aid if necessary.

### **Collecting Environmental Samples**

L-39. Control or background samples should be collected from clean areas upwind and/or near the incident site as baseline data. The control samples must be identical to the samples collected from the contaminated areas (such as liquid, soil, vegetation). The contaminated samples are compared to the baseline data (control samples). This is especially true if unknown or nonstandard chemical and/or suspected biological agents were employed. Control samples generically are the same as those collected in an alleged attack area. The size of an environmental control sample should be about the same as the suspected contaminated sample collected from the attack area. The CST medical section uses the control samples to compare with a similar contaminated item during the analysis process.

### **Collecting Air and Vapor Samples**

L-40. The CST collects samples of air by using devices that draw air through a filter material that selectively removes certain compounds from the air or by taking a volumetric air sample.

L-41. The amount of contaminants in the air is influenced by several factors, such as—

- Atmospheric or meteorological conditions.
- Contaminant flow rate into the environment.
- Physical state of the contaminant.
- Contour of the terrain.

### **Collecting Water Samples**

L-42. Water sampling is a matter of collecting enough water to get acceptable information about its contaminants.

### **Collecting Soil Samples**

L-43. Soil surrounding a CBRNE incident site is an appropriate place to collect samples for toxic/organic compounds analysis. Samples should be



collected adjacent to suspected contamination or where indicators of CBRNE agents exist (such as powders, oily substances, dead animals).

### Collecting Contaminated Vegetation

L-44. Before collecting samples of vegetation from an incident site, the survey team makes a visual examination of the area, looking for CBRNE agent indicators or suspected contamination. The team collects samples of vegetation that appear to be different from normal.

### Recording Information to Support Sampling

L-45. After the CST survey team has undergone decontamination and redress operations, the operations team can then develop a complete record for each sample. The completed record can be made available to the requesting agencies receiving and analyzing the sample(s). Critical information includes—

- **Circumstances of acquisition.** Describe how the sample was obtained. Note where it was found, what time it was obtained, and who collected the sample.
- **Physical description.** List the physical state (solid, liquid, powder, apparent viscosity), color, approximate size, and identity (such as military nomenclature) of the specimen, dirt, leaves, and so forth.
- **Circumstances of agent deposition.** If known, note the type of delivery system; describe how the weapon functioned; how the agent acted on release; sounds heard during dissemination; any craters or shrapnel found associated with a burst; and colors of smoke, flames, or mist that may be associated with the attack.
- **Agent effects on vegetation.** Describe the general area (urban, jungle, mountain, grassland) and changes in the vegetation after agent deposition (color change, wilting, drying, dead) in the main attack and fringe areas.
- **Agent effects on humans.** Describe how the agent affected personnel in the main attack area versus fringe areas. Note the duration of agent effects, peculiar odors that may have been noticed in the area prior to, during, and/or after an attack; measures taken that alleviated or deteriorated the effects; and the approximate number of victims and survivors, to include their ages and genders.
- **Agent effects on animals.** Note the types of animals that were or were not affected by an attack and a description of how they were affected.

### Packaging and Marking Samples for Transfer

L-46. Materials used for packaging samples primarily consist of tamper-resistant tape, collection bags, specimen jars and tubes, pigs, ice chests, tape, sealing materials, and wrapping and cushioning supplies. The utilization of these materials is described below:

- **Collection container.** Survey team personnel use the EPA-approved sampling container as the initial container for such samples

as protective masks and filter canisters, individual antidote and decontamination kits, munition fragments, and other items too large to place in a specimen jar. The container acts as an initial or secondary vapor barrier to prevent air from leaking inward and toxic material leaking outward.

- **Glass specimen jars.** Use glass containers to hold small environmental samples because toxic agents may react with chemicals from plastics and introduce contamination, confusing the analysis efforts and/or dissolving the container and allowing HAZMATs to leak.
- **Sealing and marking material.** If the container has a screw-on lid and no O-ring, place plumbers tape (NSN 8030-00-889-3535, tape, antiseize) on the threads of the container before putting on the lid. This helps to limit the leakage of liquids and vapor from the container and ensures that the lid will not fall off while in transit. If the lid has a cardboard liner, remove the liner and replace it with one or two layers of film (a laboratory sealant film). Once the lid is on, stretch the film around the outside of the container at the junction of the lid and the glass. Two wraps of the film are enough to provide a leakage barrier and ensure that the lid cannot fall off. At this point, ensure that the sample number is on the outside of the container. If it is not, use an adhesive label to record the sample number on the outside of the container.
- **Ice chest.** Standard polyethylene or metal ice chests are the most easily procured items used for shipping CB samples. The most easily used size is about 24 inches long by 18 inches high by 15 inches deep. Use self-contained cooling tubes (cooling vest type) to keep the sample cool. Standard ice should only be used as a last resort because of its rapid melting rate and the possibility that the melted ice may contaminate samples.

## DOCUMENTATION

L-47. In order to maintain the chain of custody, the survey team members complete a written record for each sample using DD Form 1911 or other approved documentation. Whoever later assumes responsibility for the care of the sample should add his name and the date and time he received the sample. The minimum information required on the exterior of all sample containers is—

- Date, time, and location of the sample.
- Identification of the person who took the sample.
- Physical description of the sample.
- Sample number (samples are numbered consecutively).

## EXITING AND EXTRACTION FROM THE HOT-ZONE

L-48. The survey team advises the operations team that they are departing the incident site, or the operations team advises the survey team to immediately depart the incident site. After concluding all testing/sampling operations, the survey team will collect equipment and samples for removal from the hot-zone and will report items that were not removed. They will

generally depart the incident site via the same route used to enter the site. Entry and backup teams will link up (informing the operations team and decontamination team, if necessary) and depart the incident site. The priority for decontamination goes to downed/injured team members, members lowest on air, samples, video records, evidence, and equipment.

## MARKING CONTAMINATED AREAS

L-49. Marking a contaminated area indicates the presence of a hazard. The extent of a hazard is determined by a detailed survey. Signs will be placed, where possible, according to the NAERG for the particular hazard.

## PRESERVING THE CRIME SCENE

L-50. Appropriate law enforcement personnel should collect evidence. At incident scenes, appropriate agencies, such as the FBI, are responsible for collecting and documenting evidence. During CM operations, CST survey teams enter a crime scene to conduct detection and identification.

L-51. To ensure consistent documentation, control, and security, it may be useful to designate CST personnel to coordinate with law enforcement authorities. Potential physical evidence related to an incident scene often includes, but is not limited to—

- Equipment.
- Tools.
- Wires.
- Hardware.
- Computer disks.
- Pre- and postincident positions of incident-related elements.
- Scattered debris.
- Patterns, parts, and properties of physical items associated with the incident.

L-52. Less obvious (but potentially important) physical evidence includes fluids (liquids and gases). Significant physical evidence is often found in obscure and seemingly insignificant places, such as hinges and supports.

L-53. When preparing to remove samples from an incident site, the following guidelines are recommended:

- Document (photograph) the crime scene, in particular those areas where samples are collected.
- Do not start extraction and removal or movement of items until position records (measurements for maps and photographs) have been made.
- Be aware that the incident site may be unsafe due to dangerous materials or a weakened structure.
- Mark locations of removed items according to IC guidance and/or the unit SOP.
- Exercise care during extraction and preliminary examination to avoid defacing or distorting impact marks and fracture surfaces.

## POSTINCIDENT PHASE

L-54. The postincident phase consists of two elements: redeploy and unit reconstitution operations. This phase begins when the IC has determined that the CST is no longer required for incident support. The CST may maintain engagement with incident mitigation if state or federal authorities determine that continued assistance is required and the deploying authority concurs.

L-55. The survey team ensures that all equipment is on hand and that all vehicles are reconfigured according to load plans. The survey TL updates the list of all expendable items and coordinates with the logistics team for support.